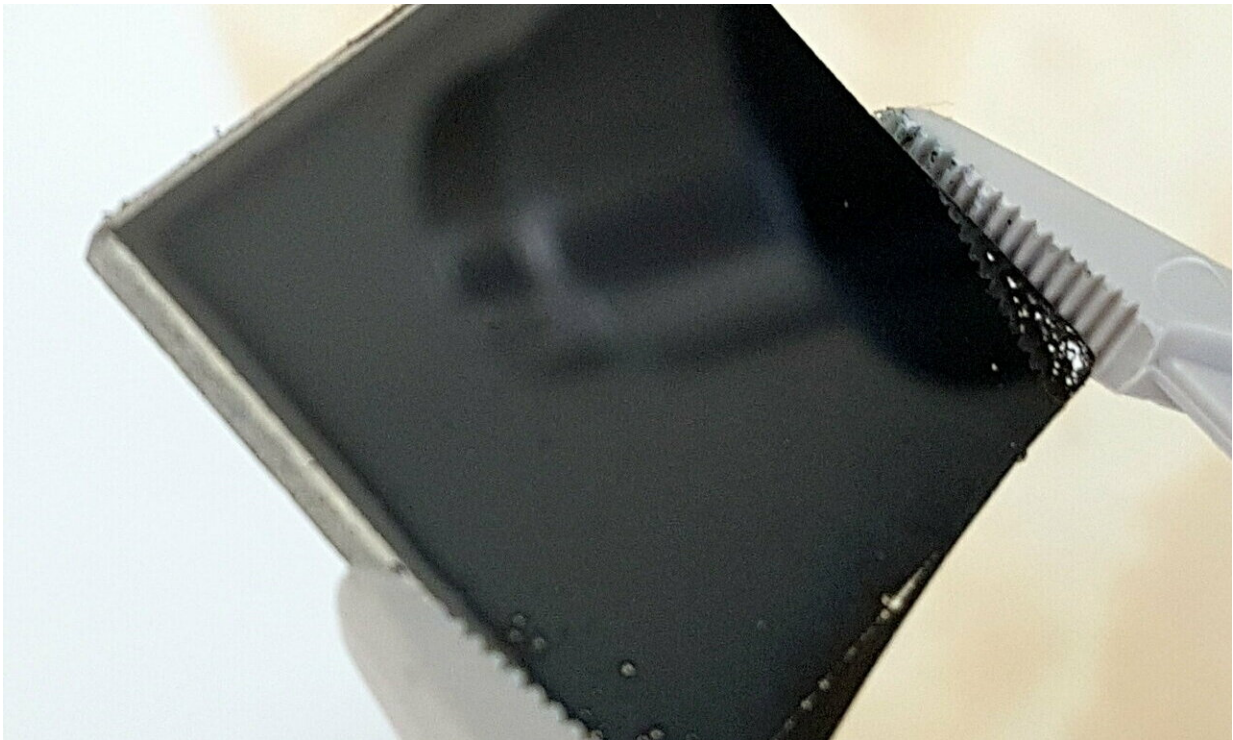


GraphON: Conductive coatings and materials breakthrough

February 20 2019, by Csiro



A GraphON coating on quartz. Credit: CSIRO

Australia's national science agency, CSIRO, has created a breakthrough new form of graphitic material that's conductive, easy to apply and offers greater control over performance than graphene.

GraphON can also be manufactured cheaper and easier, with more

flexibility and less hazardous waste than comparable products. CSIRO's Dr. John Tsanaktsidis said, "GraphON has the potential to offer industries like aerospace and defence an innovative new way to conduct heat or electricity through a [surface coating](#) or composite structure.

"Potential uses include electrostatically dissipative coatings, electromagnetic interference shielding, electrical heating (de-icing), conductive coatings, and anticorrosion coatings."

A patented CSIRO technology, GraphON is produced by heating the mass-produced polymer polyaniline dinonylnaphthalenesulfonic acid (PANI.DNNSA) to 650°C. As CSIRO's form of this polyaniline can be dissolved in common organic solvents, it is easily blended with other polymers and paints. Coating PANI.DNNSA directly onto an object and then heating it produces a conductive graphitic [coating](#), GraphON, without the need for additional processing steps.

"What is different about GraphON is that it comes directly with imbedded heteroatoms such as nitrogen and oxygen in the graphitised material," added Dr. Tsanaktsidis. "This unique featute of GraphON greatly improves its dispersibility in a variety of other materials and solutions."

The name GraphON reflects the presence of oxygen and nitrogen in the carbon based structure."

It's easy and cheap to produce. Manufacturing GraphON is estimated to cost less than \$USD 2000/kg, another factor expected to help drive uptake and the development of new applications with it.



GraphON coated catalytic static mixer. Credit: CSIRO

"To ensure GraphON is made to the highest quality, we use flow chemistry to produce the polyaniline precursor," said Dr. Tsanaktsidis. "This guarantees the end product is scalable, consistent, and reproducible."

Other possible uses of GraphON include:

- energy capture and storage
- printed circuit board manufacturing
- chemical sensors
- conductive inks
- electrodes and supercapacitors
- textiles/fabrics

Provided by CSIRO

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